

CLAIMS

What is claimed is:

1. A styrene-free, unsaturated polyester resin composition which comprises:
 - A. an unsaturated polyester;
 - B. a urethane (meth)acrylate;
 - C. a hydroxyl-functionalized (meth)acrylate monomer; and
 - D. a multifunctional (meth)acrylate monomer,
wherein the resin composition contains low amounts of hazardous air pollutants.
2. A composition as defined by Claim 1 wherein the unsaturated polyester has a weight average molecular weight from about 1000 to about 12000.
3. A composition as defined by Claim 1 wherein the unsaturated polyester has a weight average molecular weight from about 1500 to about 8000.
4. A composition as defined by Claim 1 wherein the urethane (meth)acrylate is a product of a difunctional or polyfunctional isocyanate with a hydroxyl-functionalized (meth)acrylate.
5. A composition as defined by Claim 1 wherein the urethane (meth)acrylate is present in an amount from about 10 to about 40 percent by weight.
6. A composition as defined by Claim 1 wherein the hydroxyl-functionalized (meth)acrylate monomer is present in an amount from about 5 to about 40 percent by weight.

7. A composition as defined by Claim 1 wherein the multifunctional (meth)acrylate monomer is selected from the group consisting of 1, 4 - butanediol diacrylate, 1,6 - hexanediol diacrylate, diethylene glycol diacrylate, 1,3 - butylene glycol diacrylate, neopentyl glycol diacrylate, cyclohexane dimethanol diacrylate, dipropylene glycol diacrylate, ethoxylated bisphenol A diacrylate, trimethylolpropane, triacrylate, pentaerythritol triacrylate, pentaerythritol tetracrylate, the methacrylate analogues of such monomers and a mixture thereof.

8. A composition as defined by Claim 1 wherein the multifunctional (meth)acrylate monomer is present in an amount from about 5 to about 40 percent by weight.

9. A composition as defined by Claim 1 wherein the unsaturated polyester is present in an amount from about 20 to about 70 percent by weight.

10. A composition as defined by Claim 1 wherein the hydroxyl-functionalized (meth)acrylate monomer is selected from the group consisting of 2-hydroxyethyl methacrylate, 2-hydroxylpropyl methacrylate, 2-hydroxylpropyl acrylate, analogues of such monomers and a mixture thereof.

11. A composition as defined by Claim 1 wherein the unsaturated polyester has an acid number of less than about 50.

12. A composition as defined by Claim 1 wherein the unsaturated polyester is at least partially derived from an epoxy allyl ether or a hydroxyl-functionalized allyl ether.

13. A composition as defined by Claim 12 wherein the epoxy allyl ether or hydroxyl-functionalized allyl ether is used in an amount up to about 30 percent, by weight, based on an initial polyester synthesis charge.

14. A composition as defined by Claim 1 wherein the unsaturated polyester is at least partially derived from an epoxy functionalized (meth)acrylate.

15. A composition as defined by Claim 1 wherein the epoxy functionalized (meth)acrylate is used in an amount up to about 30 percent by weight, based on an initial polyester synthesis charge.

16. A composition as defined by Claim 1 wherein the urethane (meth)acrylate is derived from an aliphatic isocyanate.

17. A composition as defined by Claim 1 which contains up to about 10 percent by weight of a thixotropic agent.

18. A composition as defined by Claim 1 which contains up to about 40 percent by weight of a pigment.

19. A composition as defined by Claim 1 which contains up to about 5 percent by weight of a suppressant.

20. A composition as defined by Claim 1 which contains up to about 10 percent by weight of an ultraviolet light absorber or ultraviolet light stabilizer.

21. A composition as defined by Claim 1 wherein the resin composition is cured by a free-radical initiator.

22. A composition as defined by Claim 1 wherein the resin composition is cured by ultraviolet light or electron beam.

23. A composition as defined by Claim 1 wherein the resin composition is cured by a free-radical initiator and a metal carboxylate.

24. A composition as defined by Claim 1 wherein the resin composition is cured by a free-radical initiator, a metal carboxylate and a nitrogen-containing compound.

25. A process for the manufacture of a styrene-free, unsaturated polyester resin composition, wherein the process comprises mixing:

- A. an unsaturated polyester;
- B. a urethane (meth)acrylate;
- C. a hydroxyl-functionalized (meth)acrylate monomer; and
- D. a multifunctional (meth)acrylate monomer,

wherein the resin composition contains low amounts of hazardous air pollutants.